

OCT 2014.

Report

Waikaraka Park - Grandstand Concrete Inspection Review

Prepared for Downer NZ Ltd (Client)

By Mannco Consulting Ltd (MCL)

10 October 2014



Nelson St Onehunga

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Appendix A Photos with Captions

Appendix B Proposed Sika Repairs

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1 Introduction

We met with a representative from Downer at the site on the 26 August and 30 September 2014 to view the Waikaraka Park Grandstand. During these visits we conducted a brief visual inspection of the damaged concrete. During both visits we noted as detailed in this report numerous places where obvious failings were observed as continued deterioration of the concrete structure (both in previous patched areas and yet unpatched areas).

In this report we have highlighted with photos representative damage observed in the concrete structure, some of which we note appears to affect the structural integrity and in our opinion beyond the new patch repair methodology outlined in appendix B. These areas will we believe require a more detailed investigation, incorporating structural design analysis, intrusive investigations, sampling and testing, beyond the scope of this report.

2 Organization of this report

In Appendix A, photographs provide a representative indication of the deterioration and damage observed.

In Appendix B, Sika provide a product and methodology applicable for minor crack repairs.

In Appendix C, We provide a 1980s newspaper article (found held at the Auckland library newspaper archives on microfilm) indicating there has been previous problems that were engineer investigated and reported upon.

3 Discussion

We believe from our brief visual inspections the damage observed appears wide ranging. We believe that similar to old wharfs and bridges that this structure will need analysis input from a firm such as Contech (Construction Techniques Ltd) so we can determine the current extent of corrosion damage and its structural integrity can be assessed.

We understand that when it was being constructed by US servicemen engineers during the War, they may have used sea sand in the aggregate and batch mixing techniques on site. It appears that previous remedial work has been done in the vertical isolated columns and patching extensively has occurred in various places. But it would appear that deterioration and steel rusting has continued.

We observed several areas where we believe that temporarily propping is required at present, for example under the upper stair landings, in the bays under the front edge of the upper terrace and to the rear wall columns, where cracks were observed.

There appears to be evidence of previous extensive repairs having been undertaken, some of which appear now to be failing. Previous patches may have masked problems and lost structural integrity may not be regained by just further patching alone.

4 Limitations

This report has been prepared based on a brief walk around and visual observation only of the assessable structure. No review of any existing drawings, plans, reports, state of the concrete or structural analysis has been undertaken. Nor any on-site intrusive investigations or sampling.

Yours sincerely



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Appendix A

Photos with Captions

Photos which highlight the cracks observed seen

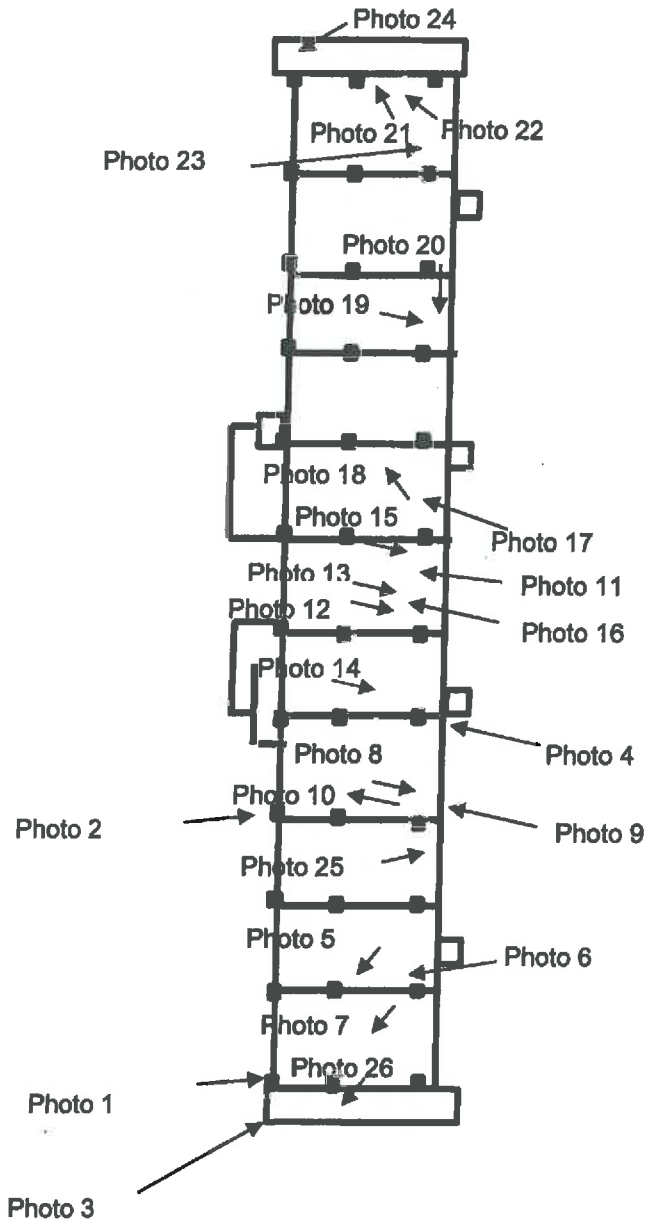


Figure 1 Plan which references where photos have been taken



1. Location of crack in rear SW concrete column



2. Location of crack in rear intermediate concrete column



3. Location of cracks from upper South landing support beam



4. Location of cracks in cantilever beam



5. Location of cracks in upperside of upper terrace seating



6. Location of cracks in lower terrace seating



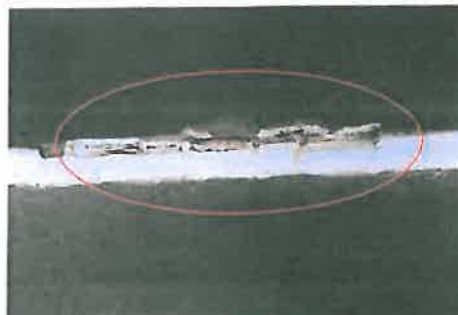
7. Location of spalling concrete in lower terrace seating



8. Location of cracks in patching of upper terrace beam



9. Location chipped off corner concrete in terrace aisle walkway



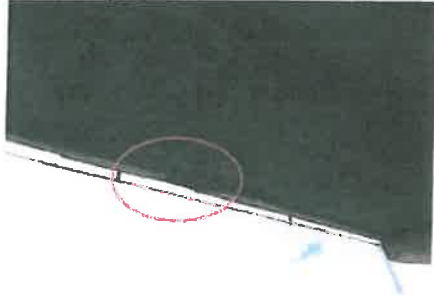
10. Location blown off cover concrete and rusting reinforcement



21. Location of cracks in patches in main beam under upper terrace



22. Location of cracks in main beam under upper terrace



23. Location of failure of trim beam across front of upper terrace



24. Location of failure cracks in upper Nth landing stair beam



25. Location of cracks in upper deck



26. Location of cracks in exterior concrete stairs

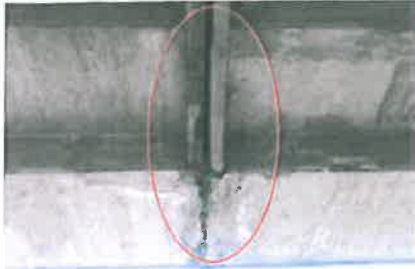
spalling



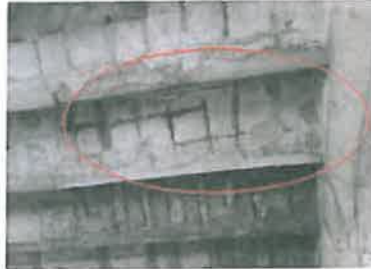
11. Location of crack along central lower floor beam



12. Location of cracks in patches under upper seating



13. Location of cracks in upper dividing joint patches support beam



14. Location of cracks surrounding previous patches in underside of upper seating



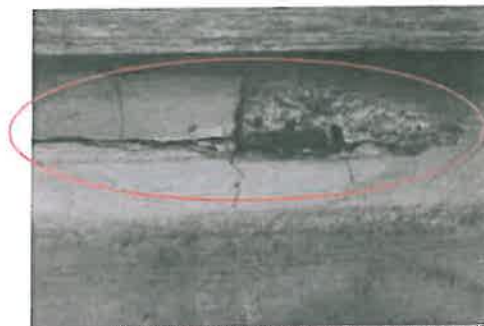
15. Location of concrete efflorescence in upperside of upper terrace seating



16. Location of cracks in patches of lower terrace seating



17. Location of brusing reinforcement in lower terrace seating



18. Location of rusted through reinforcement in lower terrace seating



19. Location fallen off cover to rebar in lower seating front wall



20. Location blown off cover concrete and rusting reinforcement in underside of upper terrace seating